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## Studies on surveys for significant insect pest occurrence on farmers' fields in the Jalna area of Maharashtra

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### Abstract

The experiment was carried out to investigate the prevalence of several pigeonpea pest insects in the Jalna area of Maharashtra. *Exelastis atomosa* population statistics show that Jafrabad taluka had the highest larval population, with 1.8 larvae per plant, followed by Bhokardan and Partur, both with 1.00 larvae/plant. Ambad Taluka had fewest larvae (0.5/plant), which was followed by Jalna, Badnapur and Ghansavngi (0.8/plant), and Mantha (0.9/plant). The greatest reported larval population of *Maruca vitrata*, 1.5 larvae per plant, was seen in the same taluka, Jafrabad, according to data collected on the species. Second, there was a moderate infestation, or one larva per plant, in Jalna and Bhokardan. The Badnapur site had the lowest field incidence, with 0.6 larvae/plant, followed by Partur (0.7 larvae), Ambad (0.7 larvae) and Mantha (0.8 larvae), whereas Ghansavngi reported 0.7 larvae per plant. *M. obtusa* showed a similar trend in field incidence, with the maximum recorded incidence of 1.2 maggots per plant in Jafrabad. At Bhokardan, Mantha, Ghansavngi, Partur, and Jalna, the infestation of *M. obtusa* was roughly similar, with 0.8 maggots/plant. Lowest incidence, at 0.6 maggots/plant, was found in Ambad and Badnapur. The presence of aphids was also detected in small amounts at every location, ranging between 0.3 nymphs/5 cm twig in Badnapur to 0.8 aphids/5 cm twig in Jafrabad.

**Keywords:** *Helicoverpa armigera*, pigeon pea, and roving survey *Melanagromyza obtusa*, *Maruca vitrata*, *Exelastis atomosa*

### Introduction

Being one of most important grain legumes in semi-arid tropics i.e. SAT is the pigeonpea botanically known as *Cajanus cajan* (L) Millsp., also known as arhar, redgram, and tur (Nene *et al.*, 1990) [3]. After chickpea, it is second-most important pulse crop in the view of India. Pod borers are one of several pests that attack during the reproductive period and are extremely damaging, resulting in production losses of up to 52.4% in Southern Indian states. From the seedling stage through till harvesting, it is under attack by several insect pests. The pod borer complex members includes *Maruca vitrata*, *Helicoverpa armigera*, *Exelastis atomosa* *Grapholita critica*, *Lampides boeticus*, and *Melanagromyza obtuse*. The investigation to ascertain the prevalence of pod borers in the Jalna district of Maharashtra was motivated by the fact that pod borer complex development happens extremely well in a certain season and temperature.

### Materials and Methods

From 2014 to 2015, a farmer field survey on the main pigeonpea insect pest was conducted in the Marathwada area of Maharashtra's Jalna district, where pigeonpea farming is practiced extensively. In the Jalna district, a roving assessment of the main pigeonpea insect pest was conducted from Sept.2014 to Jan. 2015.

Eight villages from Maharashtra's Jalna-district recorded insect pests and their natural antagonists on pigeonpea plants. The principal pests of pigeonpea, regardless of variety, and natural enemies were assessed two times throughout the growing period in around different 40 locations across selected 8 talukas of the Jalna: first at 50% blooming stage and again at the grain-forming stage. On five randomly chosen plants per location, population counting of larvae (*Helicoverpa armigera*, *Melanagromyza obtusa* *Maruca vitrata*, and *Exelastis atomosa*, and natural enemies as well such as Chrysopids and Coccinellids were conducted.

### Results and Discussion

The average mean data shown in Table 1 indicated that nearly every significant pest and their natural enemies were seen throughout the study. According to data about *H. armigera*,

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Jafrabad taluka, with 1.2 larvae per plant, had the highest documented larval population, followed by Jalna, Badnapur, Partur, Bhokardan and Mantha and there was a uniform population (1/plant). Lowest population of *H. armigera* was found in Ambad, where there were 0.7 larvae/plant, next to which was Ghansavangi, where there were 0.9 larvae/plant.

Data on *E. atomosa* shows that largest larval population reported in the Jafrabad taluka (1.8 larvae/plant), followed by Bhokardan and Partur @ 1.0 larva/plant. Data recording incidence of *M. vitrata* is also clear that maximum population of larva was recorded in the same taluka, i.e. Jafrabad @ 1.5 larvae/plant. Lowest population was recorded at Ambad taluka (0.5 larvae/plant, followed by Jalna, Badnapur and Ghansavangi (0.8 larvae/plant) and Mantha (0.9 larvae/plant). Second, there was a moderate infestation, or one larvae per plant, in Jalna and Bhokardan. The Badnapur site had the lowest field incidence, with 0.6 larvae/plant, followed by Ambad (0.7 larvae/plant), Partur (0.7 larvae/plant), Mantha (0.8 larvae/plant), and Ghansavangi (0.7 larvae/plant).

Same pattern of incidence was seen in *M. obtusa*, documented in Jafrabad at the maximum rate of 1.2 maggots per plant. At Bhokardan, Mantha, Ghansavangi, Partur, and Jalna, the infestation of *M. obtusa* was roughly similar at 0.8 maggots/plant. The lowest incidence @ 0.6 maggots/plant, was found in Ambad and Badnapur. At every location, there were evidence of the aphid infestation, which ranged from 0.3 nymphs/5 cm twig in Badnapur to 0.8 nymphs/cm twig in the taluka of Jafrabad. Pigeonpea suffer from a vast complex of insects, including various species of Lepidopteran larvae which feeds upon the flowers and pods, although *Helicoverpa armigera* is most significant of these, according to Bhatnagar

*et al.*'s assessment of 1297 fields of pigeonpea in 1981. At a time when these pests haven't had enough time to develop into a sizable population in the north-west and also noticed that damage caused due to lepidopteron larvae tends to reduce in north where the crop mature after the winter. They also came to the conclusion that the pod fly, which tends to be more significant in the central and northern regions in late ripening crops, is second most destructive insect on pigeonpea in India. According to the findings, the Jafrabad Taluka had the highest predator activity rates, with 0.6 coccinellid, 1.1 chrysopid, and 0.6 spider larvae or adult/plant. It might be because of the large number of significant pests that have been found in the Jafrabad talukas. The behavior of chrysopoids, coccinellids, and other predatory spiders was largely consistent throughout the other seven talukas.

It implied that Jafrabad offered greater diversity than other locations. It could be brought on by the interplay of natural resources and food availability. The results were in line with those published by Duffeled (1995) [2], who suggested that increased insect abundance may be related to soil quality and the predominating ecological balance, and that this is especially true when high diversity index of species richness tends to have lower values.

Degree of dominance by most to moderately numerous species, as defined by abiotic and biotic component, was believed to be distinct in the diversity indices from the eight locations. According to Wang *et al.* (2000) [4], the loss of the infrequently counted species was the major reason for the decline in species richness. Therefore, it appears that environmental factors like temperature, relative humidity, rainfall, and wind have an impact on how different insect species are distributed in the chosen research locations.

**Table 1:** Survey pod borer complex of pigeonpea in Jalna district, Maharashtra

Name of Block	Average Population per plant						
	Plume moth	Maruca	Pod fly	Aphid	Coccinellids	Chrysopid	Spider
Ambad	0.5	0.7	0.6	0.3	0.4	0.5	0.3
Badnapur	0.8	0.6	0.6	0.6	0.6	0.7	0.4
Jalna	0.8	1.0	0.8	0.4	0.5	0.6	0.3
Partur	1.0	0.7	0.8	0.3	0.6	0.6	0.3
Ghansavangi	0.8	0.9	0.8	0.6	0.3	0.8	0.4
Mantha	0.9	0.8	0.8	0.7	0.3	0.7	0.4
Jafrabad	1.8	1.5	1.2	0.8	0.6	1.1	0.6
Bhokardan	0.5	0.7	0.6	0.3	0.4	0.5	0.3

## Conclusion

The above study clearly indicates that Jafrabad tehsil of Jalna district of Maharashtra have higher incidence of pod borer complex. Hence selection of proper cultivar with resistance against pod borers is crucial for the farmers to combat this menace.

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